What Drives Global Syndication of Bank Loans?
Effects of Capital Regulations

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Abstract

The syndicated lending market is highly globalized. We examine the effect of cross-country differences in capital regulations on the structure of global lending syndicates. Using a sample of loans syndicated by banks from 44 countries, we find evidence consistent with regulatory arbitrage incentives of participant banks. Banks from strictly regulated countries participate more in syndicates originated by banks from less regulated countries. This pattern is robust to controlling for characteristics of lead-participant bank pairs or holding fixed borrower-side conditions. Consistently, strictly regulated banks are more likely to participate in foreign-led loans to riskier borrowers, earn higher spreads, and bear higher credit risk.

Key words: Syndicated Loans, Cross-Border Banking, Banking Regulation, Capital Requirement, Regulatory Arbitrage.

JEL classification: G21, G30

1 Introduction

The syndicated lending market has become highly globalized. Over the past two decades, nearly 60% of loans have been issued by a lead bank syndicating with participant banks from other countries (i.e., globally syndicated loans). The total amount of globally syndicated loans has risen from $800 billion in the 1990s to over $2 trillion in recent years. U.S. banks, in particular, have increasingly participated in global syndicates. Figure 1 suggests that U.S. banks have increased their allocation to foreign-led syndicates from less than 30% of their total lending in the late 1990s to nearly 60% in 2016.

Despite the popularity of global syndication, little is known regarding the incentives that banks face to form such syndicates. In this study, we shed light on this issue by examining the effect of capital regulation differentials across countries on global syndication structure. As capital regulation affects banks' risk tolerance and investment choices (Barth, Caprio, and Levine (2004), Laeven and Levine (2009)), disparity in regulatory regimes should naturally create incentives for cross-country syndication. We conjecture that, with global syndication, banks may be able to exploit regulatory differences across countries by partnering with foreign lead arrangers that have different risk appetite.

Using information on loans syndicated by banks from 44 countries, we document a strong pattern that banks from strictly regulated countries participate more in loans initiated by banks from less regulated countries. This pattern is robust to various empirical specifications, such as the inclusion of lead bank fixed effects, participant bank fixed effects, year fixed effects, and time-varying macroeconomic conditions of both the lead and participant countries. This result is also robust to controlling for bank-pair fixed effects, lead bank-year fixed effects, or to restricting lead lenders to be in the borrower's country. These specifications suggest that the observed relation between regulatory differences and global syndication patterns is not driven by banks' innate characteristics or other unobservable factors that might affect the matching between banks. Our results are also economically meaningful. A one-standard-deviation increase in the difference in capital stringency between two countries is associated with approximately a 4.0% increase in syndication activity between banks headquartered in these countries.
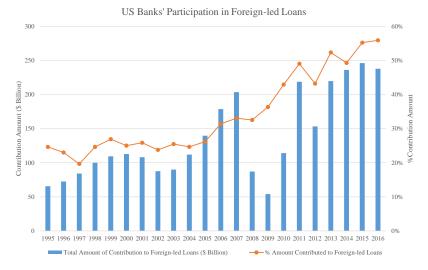
Figure 1. Participation in global syndicates by U.S. banks over time. This figure presents the time-series trend in the participation of U.S. banks in syndicated loans originated by banks from other countries (i.e., foreign-led syndicates). The blue columns indicate the total amount of capital that U.S. banks contribute to foreign-led syndicates every year. The solid line indicates the percentage of capital contributed by U.S. banks to foreign-led loans relative to the total capital contributed by U.S. banks to all syndicated loans each year. The left vertical axis shows the amount of contribution (in $billions), the right vertical axis indicates percentage contribution, and the horizontal axis indicates years.

Our findings are consistent with the regulatory arbitrage incentive of participant banks, whereby strictly regulated banks seek to circumvent capital regulations in their home countries by participating in loans originated by lead arrangers from loosely regulated countries (*regulatory arbitrage* hypothesis). In this type of globally syndicated deals, participant banks can rely on the expertise of a less regulated lead arranger, who frequently prospects, screens, and monitors borrowers with greater credit risk. Participants can thus access a pool of foreign, risky borrowers without facing excessive risks of adverse selection or reputation damage associated with loan defaults in subsequent syndicated deals (Gopalan, Nanda, and Yerramilli (2011)). Moreover, participating banks may be better able to bypass scrutiny as regulators face a greater degree of information asymmetry in assessing the quality of foreign loans.[1] Importantly, a large body of evidence suggests that risk-based capital regulations give banks the discretion to manipulate reported asset risk (see, e.g., Vallascas and Hagendorff (2013), Begley, Purnanandam, and

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[1]Regulators also recognize that examining foreign syndicated loans is not as straightforward as examining domestic loans. For example, the "Manual of Examination Policies" issued by the FDIC claims that "the difference in international lending is that applicable information is usually less readily available and less detailed. ... Thus, in the financial evaluation of international loans, the credit decision must frequently be based on information inferior to that available in domestic applications."

Zheng (2017), and Plosser and Santos (2018)). Risk-based capital regulations specify the minimum amount of capital reserves as a percentage of risk-weighted assets, where the weighting scheme depends on broad risk categories of the assets (Basel Accords). Basel II, in particular, allows banks to assign internal ratings to loans based on their own estimates of the default risks. As a result, global syndication provides a unique channel through which banks could bypass strict capital regulations in home countries.[2]

If strictly regulated banks join global syndicates to circumvent capital regulation, they should be more likely to participate in riskier deals abroad in search of higher spreads. We verify this incentive by looking into the terms and performance of globally syndicated loans. To maintain comparability across borrowers, we focus on a sample of globally syndicated loans extended to U.S. public firms. We first observe that strictly regulated banks often lend to firms that are smaller, unrated, and have less tangible assets, all of which suggest a riskier and more opaque borrower base. Moreover, loans syndicated with strictly regulated participants often charge higher interest rate spreads and have a higher default likelihood, consistent with these loans having higher credit risk. Finally, global syndication seems to facilitate the access to credit by risky borrowers, who exhibit an increase in employment and growth when participant countries impose tight capital regulations. Overall, these results corroborate our baseline findings and provide support for the regulatory arbitrage hypothesis, i.e., banks from strictly regulated countries seek profitable, yet riskier investment opportunities by joining foreign-led lending syndicates.

Our loan-level analyses suggest that it is important to account for the variation in borrower bases and credit demand across lending syndicates. To remove the effects from borrower-side determinants, we next design a test that holds fixed both the conditions of the borrower and of the lead lender. Consistent with our baseline findings, we find that banks in countries with strict capital regulations are more likely to participate in a given loan than banks under loose regulations. A one-standard-deviation increase in capital regulation index is associated with a 14% increase in the likelihood that a bank participates in the global syndicate lending to a given borrower.

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[2]We do not predict that strictly regulated banks will directly originate loans to foreign borrowers. We directly test a bank's choice between leading and participation in Section 5.4.

We conduct several additional tests to corroborate our argument that capital regulations affect global syndication activities. We start by exploring factors that could mitigate or aggravate banks' regulatory arbitrage incentives. First, we examine banks' capital adequacy as capital constrained banks should have a stronger incentive to circumvent regulation (see, e.g., Boyson, Fahlenbrach, and Stulz (2016)). Next, we consider country-level governance. Banks may find it difficult to conduct regulatory arbitrage if regulations are strictly enforced. Finally, we conjecture that the accounting quality and standards in a country should inhibit regulatory arbitrage. If a bank is subject to frequent external audits and is required to publish standardized and transparent financial reports, it should have less flexibility in reporting the risk level of its foreign assets. Consistent with our conjectures, we find that banks facing stricter capital regulations are less likely to participate in a global syndicate if they have sufficient Tier-1 capital, face strong enforcement of regulation, and need to maintain a high-quality accounting standard.

We next address endogeneity concerns related to capital regulations. One potential concern is reverse causality, i.e., cross-border syndication can influence the differences in capital regulations across countries. We alleviate this concern using an instrumental variable (IV) estimation, selecting as instruments the geographical, ethnic, and social features of a country that have been shown to predict banking regulations (e.g., Houston, Lin, and Ma (2012) and Karolyi and Toboaba (2015)). The IV-based analyses confirm our baseline results that differences in capital stringency lead to more global syndication.

We consider an alternative explanation for our findings. It is possible that lead lenders may prefer to fill syndicates with strictly regulated banks, as they are better able to withstand credit shocks (*risk-sharing* hypothesis). We empirically test this hypothesis by separately examining the role of capital regulations in lead and participant countries. We find that the formation of a global syndicate is largely driven by the regulation faced by participants instead of the lead lender. Moreover, strictly regulated lead lenders are less likely to originate global syndicates. These syndication patterns are not in support of the risk-sharing hypothesis.

In the last step of our analyses, we conduct a number of robustness tests. We start

with an event-based test that exploits the precise timing that banks obtain regulatory approval to use internal-rating based (IRB) models under Basel II.[3] We find that as banks switch to a more relaxed capital regulation, they engage less in global syndicates led by loosely regulated banks. Next, we construct a measure of syndication activity using the dollar share of loans contributed by each bank and find robust results. In addition, we show that other risk-inducing regulatory features, such as a lack of restrictions on bank entry or a high level of deposit insurance, are also associated with greater participation in global syndicates originated by loosely regulated banks. Moreover, our results persist if we control for the existence of foreign subsidiaries for participant and lead banks, or if we restrict the sample to non-U.S. banks. Finally, we verify that strictly regulated banks are more likely to participate in than originate syndicates to foreign borrowers.

Our study contributes to several strands of literature. First, this study is the first to examine the determinants and formation of global lending syndicates. The extant literature on debt contracting and banks' syndicate lending activities largely takes as given the structure of lending syndicates and the sources of funding for syndicate loans (see, e.g., Lin, Ma, Malatesta, and Xuan (2011), Hertzel and Officer (2012), Valta (2012)). Several recent studies examine factors that could affect bank syndication networks. Cai (2010) documents a reciprocal arrangement for syndicate lead arrangers. Gopalan et al. (2011) find that negative credit events diminish the size of syndicates in the future. Cai, Eidam, Saunders, and Steffen (2017) document that banks form syndicates based on their lending expertise. Lim, Minton, and Weisbach (2011) and Ivashina and Sun (2011) document that lending syndicates with institutional investors charge higher interest rates. We contribute to this literature by showing the importance of global syndication and demonstrating the impacts of bank regulations on the structure of such syndicates.

Second, our study adds to the recent research on banks' cross-border activities and regulatory arbitrage (e.g., Houston et al. (2012), Ongena, Popov, and Udell (2013), Karolyi and Taboada (2015), and Frame, Mihov, and Sanz (2017)). Existing studies suggest that banks may circumvent domestic regulations by setting up subsidiaries and

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[3]We thank Mike Mariathasan for kindly sharing the data on IRB approval.

branches or acquiring banks outside the border. Our study complements this stream of literature by showing that participating in global syndicates is an alternative, and perhaps a less costly way of conducting regulatory arbitrage. Using granular information on loan contracts and inter-bank syndication activities, our findings also shed new light on how regulatory arbitrage incentives can affect the access to credit by foreign corporate borrowers through changing the composition of global lending syndicates.

More broadly, our study relates to the existing literature examining the effect of capital regulations on banks' costs of capital, risk-taking behavior, and the health of the banking sector. Prior studies find that higher capital adequacy requirements increase banks' funding costs (Kashyap, Stein, and Hanson (2010), Baker and Wurger (2015)), promote their resilience to negative shocks (Dewatripont and Tirole (1994) and Berger, Demsetz, and Strahan (1999)), and reduce their willingness to screen borrowers and extend loans (Koehn and Santomero (1980), Thakor (1996), and Gorton and Winton (2003)). Aiyer et al. (2014) and Forbes, Reinhardt, and Wieladek (2016), in particular, show that strict capital regulations in the U.K. reduce cross-border lending. Our paper builds on this literature and provides evidence that global syndication is a channel through which cross-country differences in capital regulations affect banks' lending to borrowers in relatively less regulated countries.

2 Data

2.1 Sample Construction

We obtain data on syndicated bank loans during the period of 1995 through 2016 from the LPC Dealscan database. We first restrict the sample of institutions to only those classified as "banks" in Dealscan. Next, we restrict our sample to countries with at least five banks that collectively initiate more than 100 loans per year. Single-lender loans and loans with missing country information of lenders are excluded.[4] These sample selection criteria limit our sample to 44 countries, who originate more than 96% of loans

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[4]We additionally exclude Vietnam from the sample because of limited availability of bank regulation information.

in the Dealscan universe. We further sample on relevant global syndication partners, i.e., pairs of banks from different countries who are observed to appear in the same syndicated deal at least once in our sample period. This criterion eliminates bank pairs with no variation in syndication activities and prevents those observations from inflating the sample.[5]

We aggregate loans and classify locations of lenders based on ultimate parent banks. This aggregation choice takes into account that banks may extend loans through their foreign subsidiaries and also the possibility that the capital adequacy of parent banks can affect the lending behaviors of subsidiaries and branches.[6] To identify the ultimate parent bank of each lender, we primarily rely on bank ownership structure information provided by Dealscan and revise that information based on bank mergers.[7]

Our empirical objective is to examine the decision of banks to participate in loans originated by foreign lead arrangers. To identify lead lenders, we follow Bharath et al. (2011) and define lead lenders as banks that are classified by Dealscan as "Lead Arranger," "Agent," "Administrative Agent," "Arranger," or "Lead Bank."

We organize our testing sample in three ways. Our primary sample is a bank-pair-year panel that contains 766,686 observations of 62,212 bank pairs and spans the years from 1995 through 2016. The unit of observation is a pair of lead bank i and participant bank j ($i \neq j$) in a given year t. This data provides granular information on how individual banks respond to country-level regulations, thus allowing us to examine whether differences in capital regulation stringency between two countries affect the likelihood that banks from one country will join syndicates initiated by banks from the other country.

Our second sample is a borrower-year-country panel. This sample allows us to study banks' participation decisions while holding fixed borrower-side characteristics and lead

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[5]Including all bank pairs will not change our statistical inferences.

[6]In untabulated analyses, we verify that our results hold if lender locations are classified at the subsidiary level. The majority of banks in our sample (92%) do not have subsidiaries outside their home countries. We discuss more in detail the potential influence of this aggregation choice on our results, and control for the existence of foreign subsidiaries in Section 6.2.2.

[7]Dealscan only provides information on the most recent ownership status. For example, Wachovia was an independent bank entity prior to the merger with Wells Fargo in 2008, but it is identified in Dealscan as a subsidiary of Wells Fargo for all loans it extended. We re-assign loans to ultimate parent banks prior to the merger based on bank acquisition and merger information extracted from SDC database, supplemented by institution history information from National Information Center (NIC).

lenders' conditions. To construct this sample, we start with all borrowers in Dealscan and create borrower-year observations using the years when those firms obtain at least one syndicated loan with a face value over $100 million. In this way, we restrict the sample to the borrowers whose credit demand is sizable enough for potential global syndication. We then expand the sample to a borrower-year-country panel to compare the participation of all foreign banks who are potential syndicate partners. In doing so, we define "foreign" banks as those located outside the countries of the borrowers and lead lenders. Using this sample, we examine the relationship between a country's banking regulation and the participation decision of its banks, while holding constant the demand side.

Finally, we construct a loan-level sample, in which the unit of observation is a syndicated loan package. This sample allows us to examine the implication of syndicate structures on corporate borrowers. As loan contract terms vary significantly across countries (Carey and Nini (2007) and Qian and Strahan (2007)), we restrict this sample to loans issued to U.S. public firms with non-missing borrower information so as to maintain the comparability of loan contract terms and the quality of borrowers. The resulting sample contains 28,494 loans.[8] Using the loan-level sample, we examine the spreads and performance of loans extended by syndicates with strictly regulated foreign participants.

2.2 Global Syndication Measures

We consider two measures of syndication activities. First, we define *Syndicate* as a dummy variable indicating whether banks from two countries syndicate together in a given year, with one bank being the lead arranger and the other bank being the participant. In short, this variable reflects the likelihood that two banks will syndicate together. Specifically, *Syndicate* is defined as follows:

$$Syndicate_{i,j,t} = \max_{k \in K_{i,t}} 1_{i,j,k},$$

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[8]The sample of U.S. syndicated loans seems representative: it presents 52% of the syndicated loans in our full sample in terms of the number and 67% in terms of the total amount.

where i indicates a lead bank, j indicates a participant bank, and k indicates a syndicated loan. $1_{i,j,k}$ is an indicator function that equals one if bank i is a lead arranger and bank j is a participant of loan k. $K_{i,t}$ represents the set of all syndicated loans extended by bank i in year t (including both domestically and globally syndicated loans).

Syndicate is a coarse measure of syndication as it does not capture the intensity of syndication activities or the relative importance of a specific participant to a lead arranger. We next construct a continuous variable to capture such information. For each bank pair, we define *%Syndicate* as the number of syndicated loans in which bank i is a lead arranger and bank j is a participant as a proportion of the total number of syndicated loans originated by bank i in year t, as follows:

$$\%Syndicate_{i,j,t} = \frac{n_{i,j,t}}{\sum_{j \in B_t} n_{i,j,t}},$$

where B_t indicates the collection of all banks participating in loans originated by bank i in year t; $n_{i,j,t}$ represents the number of loans arranged by bank i in which bank j participates during year t. We present *%Syndicate* in percentage points. Given that *%Syndicate* scales syndication activities by the lead arranger's origination volume, it reflects the source of capital contributed to the lead bank's deals by participant banks across different countries.[9]

2.3   Capital Regulation

We extract country-level capital regulation stringency from Barth et al. (2013) (*Capital Stringency*). *Capital Stringency* is a composite index measuring the extent to which the capital requirement of a country reflects certain risk elements and market value losses. This index reflects not only the minimum capital adequacy ratio but also the source of capital reserves and the way in which banks assign risk weighting to their assets (Barth et

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[9]In Section 6.1.2, we construct an alternative measure taking into account the dollar amount of capital contributed by each participant bank. We do not use that measure as our main dependent variable because only 27% of loans have available information on lender shares in Dealscan.

al. (2004 and 2013)).[10] Regulation indices are based on cross-country surveys conducted by the World Bank. There have been four surveys (in the years 1999, 2002, 2005, and 2011) collected from 107 countries. Following Karolyi and Toboada (2011), we apply the regulation variables from the 1999 survey for observations from 1995 through 2001, the values from the 2002 survey for observations from 2002 through 2004, the values from the 2005 survey for observations from 2005 through 2010, and the values from the 2011 survey for observations from 2011 through 2016.

2.4 Controls

Syndication activities can be affected by the economic conditions in the country of each syndicate member. We thus consider country-level macroeconomic conditions that might affect the demand and supply of bank credits. To start, we control for the investment opportunities available in both the lead arranger's country and the participant's country using the log of GDP per capita ($GDP\ per\ Capita$) and real GDP growth ($GDP\ Growth$). We also control for the information asymmetry and cultural differences between lead and participant countries using the log of geographical distance ($Ln(Distance)$) and an indicator variable denoting whether the two countries share the same language ($Common\ Language$) (Giannetti and Yafeh (2012)). $Distance$ is defined as the circle distance between the capital cities of two countries. We obtain these country-level macroeconomic variables from the World Bank.

In loan-level analyses, we control for borrower characteristics, including firm size, tangibility, profitability, and whether a firm has credit ratings. We use the matching table provided by Chava and Roberts (2008) to match borrowers to financial data from Compustat. Detailed variable definitions and data sources are provided in Appendix A.

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[10]In robustness analyses, we examine the effect of other risk-inducing regulations such as entry requirement and deposit insurance and find similar results (see Section 6.3).

2.5 Empirical Methodology

Our baseline approach examines whether and how differences in capital regulation stringency affect syndication activities between two banks. To do so, we regress syndication activities between bank i and bank j on the differences in the capital regulations they face. Specifically, we estimate the following model:[11]

$$SyndicateActivity_{i,j,t} = \beta_1 \Delta Capital\ Stringency_{i,j,t} + \beta_2 Controls + \phi_i + \eta_j + \mu_t + \epsilon_{i,j,t}, \quad (1)$$

where i indicates a lead bank, j indicates a participant bank, and t indicates the year of observation. $SyndicateActivity_{i,j,t} \in \{Syndicate_{i,j,t},\ \%Syndicate_{i,j,t}\}$. $\Delta Capital\ Stringency_{i,j,t}$ measures the differences in banking regulation between the participant bank country and lead bank country (i.e., participant $-$ lead). Higher values of $\Delta Capital\ Stringency_{i,j,t}$ thus indicate that the participant bank is subject to more stringent regulations than the lead arranger.

We include lead-bank fixed effects (ϕ_i) and participant-bank fixed effects (η_j) to control for time-invariant characteristics of those banks. We also include year fixed effects, μ_t, to control for the correlation between syndication activities and capital regulation driven by common time-series trends. We further control for macroeconomic conditions, i.e., *GDP per Capita* and *GDP Growth*, as well as country-pair variables, *Ln(Distance)* and *Common Language*. Since our independent variable is country-level regulatory differences, standard errors are clustered at the country-pair level.

If banks are motivated by regulatory arbitrage incentives in forming global lending syndicates, we should observe $\beta_1 > 0$, i.e., banks from strictly regulated countries participate in syndicated loans initiated by banks from loosely regulated countries. Alternatively, if capital flows from weakly regulated countries to stringently regulated countries, we should observe that $\beta_1 < 0$.

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[11]We estimate the equation using a linear probability model instead of probit or logit specifications, because nonlinear models can generate inconsistent results with the amount of fixed effects included.
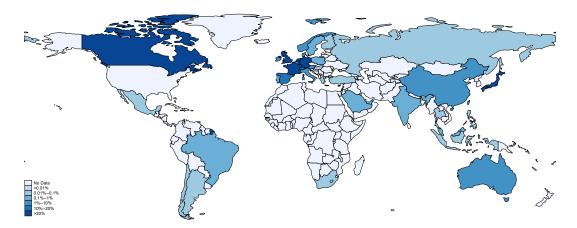
Figure 2. Participation of Foreign Banks in U.S.-led Syndicates. This figure illustrates the average percentage number of loans arranged by U.S. lead banks in which banks from a given country participate. The color scales suggest the degree of participation, with darker colors indicating a higher participation rate.

3 Univariate Analyses

We start by demonstrating the heterogeneity of banks' participation rates in global syndicates across countries. Although our study does not revolve around U.S. lenders, Figure 2 illustrates as an example the participation of banks from various foreign countries in U.S.-led loans. Darker colors in the map indicate greater participation rates by banks in a given country. The syndication pattern suggests a large heterogeneity across countries. For example, banks from Canada, E.U. countries, and Japan are among the most active participants in U.S.-led syndicates. Chinese, Indian, and Australian banks exhibit medium participation rates, while Russia and other eastern European countries rarely participate. These patterns suggest that it is important to control for country-level intrinsic characteristics through country fixed effects and measures of economic development such as GDP per capita.

Figure 3 shows the univariate relationship between capital stringency and banks' participation in global syndicates. The circles represent deals participated by banks in a given country, and the size of each circle represents the total amount of participation by each country. For the brevity of display, we only demonstrate the relationship using 25 most active participating countries in the syndicated lending market. In this plot, the vertical axis represents the capital regulation stringency of the lead lender's country, and the horizontal axis represents the stringency of the participant's country. If the syndicated
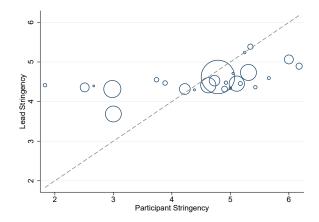
Figure 3. Capital regulation stringency of lead and paritipant countries. This figure shows the relationship between the capital stringency in the participant's country and the lead lender's country in global syndicates. Each circle represents the average deals that a country participates in. The plot contains 25 countries that contribute the highest amount of capital in the syndicated lending market. The size of the circle represents the dollar amount of each country's contribution, and the dashed line is a 45-degree line where the capital stringency of the lead country equals that of the participant country.

lending market is well integrated globally, we should observe an even participation across countries. All the circles should be randomly placed on the plot. However, we observe that the majority of loans are syndicated with participants from more strictly regulated countries than lead lenders (under the 45-degree line). This pattern is particularly strong for highly-regulated participants.

Table 1 summarizes the extent of global syndication activities by banks in each country of our sample. Columns (1) through (4) report total syndication activity by each country, including the total number of loans issued, aggregate loan amount, the number of lead arrangers, and the number of participant banks. The summary statistics show that the U.S. is the largest country in issuing syndicated loans, with 424 banks assuming the role of lead arrangers and 1,142 banks being participants. Japanese banks issue a large number of syndicated deals that are very small in size, ranking it low in terms of origination volume. Banks from Canada, France, and Germany are also top lenders in this market.

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Columns (5) through (7) report the extent of global syndication activities for each country. Column (5) shows the percentage of globally syndicated loans over the total number of loans led by banks in a given country. We also present the average percentage

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of loan amount contributed by foreign banks (Column (6)) and the percentage of foreign participant banks over the total number of participants (Column (7)). There is substantial variation in terms of syndication structure across different countries. Japanese banks, for example, maintain a relatively "isolated" syndication style in that only about 23% of syndicate loans are funded by foreign banks. In a typical Japan-led syndicate, foreign banks account for less than 20% of all syndicate members. European banks, on the other hand, seem to lend in a more "open" style. For example, 99% of the loans led by Swiss banks include at least one foreign lender with 36% of the capital contributed by foreign banks. U.S. banks exhibit an intermediate degree of global syndication activities, as U.S. lead arrangers include foreign banks in 67% of their syndicates and attract 33% of loan amount from these foreign banks.

Table 2 provides the summary statistics for our variables of interest and the availability of capital regulation index. Panel A provides summary statistics on capital stringency and measures of global syndication activities. *Capital Stringency* has an average level of 4.2 and a standard deviation of 1.7. *Syndicate* (*%Syndicate*) has a mean of 0.25 (2.19) and a standard deviation of 0.43 (7.21). These statistics suggest that there is a large variation in capital regulation stringency as well as syndication activities across countries and over time. Panel B lists the number of surveys available for each country in our sample and their average capital stringency. The majority of countries have available values from all four surveys.[12] When we compare the stringency of capital requirement across countries, we find that Australia, Singapore, and Spain are the most heavily regulated countries, and Malaysia, Czech Republic, and Sweden are among the least regulated countries.

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TABLE 2 ABOUT HERE

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[12]Only three survey values are available for Czech Republic, Japan, Saudi Arabia, and Sweden.

4 Capital Regulation and Global Syndication

4.1 Bank-level Analyses

We estimate Equation 1, using a bank-pair-year panel, to examine the relation between capital regulation differentials across countries and syndication activities. Table 3 reports the results. Columns (1) and (2) examine the likelihood of syndication between two banks, *Syndicate*, and Columns (3) and (4) consider the intensity of syndication activity, *%Syndicate*. For each dependent variable, we first report regression results with lead and participant country fixed effects and then with bank fixed effects.

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We find that the differences in capital regulation stringency between the participant and lead countries are positively associated with syndication activities between the bank pair. The estimates suggest that a one-standard-deviation increase in *Capital Stringency* of the participant country (1.72) is associated with a nearly 1-percentage-point increase in the likelihood that banks from two countries collaborate in a syndicated lending deal. The analyses of the extent of syndication activity yield a similar effect. The estimates in Column (4) indicate that when a participant is from a country with more stringent bank regulations (by one standard deviation), a lead arranger is 0.09-percentage-point more likely to syndicate loans with that participant bank. Given that the average *%Syndicate* of 2.18 percentage points, the economic magnitude accounts for about a 4% increase in the syndication activities between the two banks.

Results from our baseline analyses are consistent with the regulatory arbitrage hypothesis, which predicts that stricter capital regulations in the home country create incentives for banks to participate in global syndicates initiated by loosely regulated banks.

The positive correlation between regulatory stringency and banks' participation in global syndicates that we document could originate from either the extensive margin or the intensive margin. The extensive margin compares syndication activities across bank pairs. The intensive margin, on the other hand, refers to changes in syndication

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tendencies between a given pair of banks. Although both margins are important in their own right, the effect from the extensive margin is likely to be confounded by unobservable characteristics that are specific to the pair of banks. The intensive margin, on the other hand, tracks the recurrence of the syndication activities while holding the lead-participant bank pair constant.

Table 4 estimates the effect from the intensive margin. We focus our analyses on *%Syndicate*, for results are similar from the dummy variable. Column (1) repeats our base test (Equation 1) while controlling for lead and participant bank-pair fixed effects. Consistent with the baseline findings in Table 3, Δ*Capital Stringency* continues to attract a positive and significant coefficient. The coefficient drops from 0.051 in the base analyses to 0.027 with bank-pair fixed effects, suggesting that over half of effect from capital regulation differentials is driven by the intensive margin.

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Table 4 About Here

In Column (2), we further examine the interactive effect of regulation differences and previous syndication relationship. Prior syndication experience is measured by *Prior Syndication*, a dummy variable that equals one if the pair of lead and participant banks have collaborated in a syndication deal in previous three years and zero otherwise. In this estimation, we additionally control for the past lending activities of each bank using the log number of loans initiated by the lead bank (*Prior Lead*) and those participated by the participant bank in previous three years (*Prior Participant*). Column (3) further controls for differences in bank characteristics, including the difference in size and profitability. Bank characteristics are obtained from Bankscope.[13] Δ*Capital Stringency* $\times$ *Prior Syndication* attracts significant coefficients in both specifications. The estimates suggest that with a one-standard-deviation increase in regulation differences, banks with prior syndication experiences are 0.16-percentage-points (=1.72×0.094) more likely to syndicate together again than banks without prior experi-

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[13]Due to the limited availability of Bankscope information, about 23% of bank-pair observations remain in this specification.

ences, which is equivalent to a 7.3% increase at the sample mean.

Taken together, results from our bank-level analyses suggest that the differences in regulation stringency across countries are associated with more global syndication activities. A large proportion of that variation arises from the intensive margin. As banks seek profitable investment opportunities outside their home country, they are more likely to join lead lenders that they have previously interacted with. This result is consistent with a "quid pro quo" behavior in the syndicated lending market (Cai (2010)).

4.2 Borrower Selection, Loan Pricing, and Loan Performance

Our base results demonstrate a syndication structure consistent with the regulatory arbitrage incentive. If strictly regulated banks engage in global syndication to seek riskier investment, they should achieve greater profits but face higher credit risks while doing so. We thus examine the characteristics of borrowers, the interest rate spreads charged, and the performance of loans extended by global syndicates. In addition, we track borrowers' investment, employment, and sales growth in response to capital regulations in participant countries. These analyses not only allow us to verify the regulatory arbitrage incentive underlying the formation of global syndicates, but also shed light on the real effects of global syndication.

4.2.1 Methodology

We start by comparing borrower characteristics of syndicates consisting of strictly regulated participants and those consisting of loosely regulated participants. To do so, we define *Participant Stringency* as the average capital stringency among all of the participant banks in a given syndicate. Our sample of globally syndicated loans can then be partitioned based on whether *Participant Stringency* is higher or lower than the capital stringency of the lead country. We compare the size, tangibility, and credit rating of borrowers across the two subsamples. If banks participate in global syndicates seeking regulatory arbitrage opportunities, we expect strictly regulated participants to be associated with smaller, less tangible, and more unrated borrowers.

Next, we compare the interest rates charged by global syndicates as well as the performance of those loans. We examine interest rate markups using the all-in-drawn spreads (*Loan Spread*, in basis points over LIBOR), which measure the sum of annualized fees and interest rate costs that the borrower needs to pay. Loan spreads often increase with the credit risks of the borrower (e.g., Hertzel et al. (2008) and Altman and Suggitt (2000)). We measure loan performance using borrower default (*Loan Default*), as defaults are economically important credit events that could alter banks' future contracting tendencies and their ability to provide capital (Murfin (2012) and Chava and Purnanandum (2011)). We define *Loan Default* as an indicator that equals one if the borrower drops to default ratings by Standard & Poor ("D" or "SD") during the course of the loan.

Formally, we estimate the following regression model:

$$Y_k = \theta_1 Lead\ Stringency_{k,t} + \theta_2 Participant\ Stringency_{k,t} + \theta_3 BorrowerChar_{f,t}$$
$$+ \theta_4 DealChar_k + \phi_i + \kappa_f + \mu_t + \epsilon_k, \quad (2)$$

where k indicates a syndicated loan, f indicates a borrower, and t indicates the year of loan issuance. Y_k includes loan spreads and loan default. *Lead Stringency*$_{k,t}$ is the capital regulation stringency from the lead lender's country in year t. *Participant Stringency*$_{k,t}$ is the average capital stringency across all foreign participants' countries in year t. To control for observable differences in borrower credit quality, we include a borrower's size, asset tangibility, profitability, and whether the borrower has credit rating. In addition, we control for lead-country fixed effects (ϕ_i), borrower-industry fixed effects (κ_f) and year fixed effects (μ_t). We also include deal-level characteristics as controls, such as maturity (*Loan maturity*), the number of covenants (*Loan Covenants*), the log amount of loan principal (*Loan Size*), and the number of facilities in the deal (*Loan Facilities*).

If banks from strictly regulated countries take excessive risks by participating in loan syndicates initiated by foreign banks, we should expect higher spreads and poorer performance from these loans. In other words, the regulatory arbitrage hypothesis predicts that $\theta_2 > 0$.

Finally, we explore the implications of the regulatory arbitrage incentive on corporate

policies. In particular, we examine how the investment, employment, and sales of U.S. borrowers respond to the capital regulation stringency of foreign participant banks. To do so, we first fix a borrower-lead lender pair from the U.S. that have repeated, long-term relationships.[14] In a given year, we track back to previous loan syndicates originated by the lead bank to identify foreign countries whose banks frequently participated in those syndicates. We consider those countries as the lead bank's "syndicate partners." If those countries have recently imposed strict capital regulation standards, we expect that their banks are more likely to invest in the lead lender's deals, thus facilitating the access to credit by the lead lender's relationship borrowers. We thus estimate the following model:

$$Y_{f,i,t} = \gamma_1 Participant\ Stringency_{f,i,t-1} + \gamma_2 BorrowerChar_{f,t} + \phi_i + \xi_f + \mu_t + \epsilon_{f,i,t}, \quad (3)$$

where i indicates the lead lender that has a long-term relationship with borrower f, $Y_{f,i,t}$ includes borrowers' investment, log of employment, and log of sales. *Participant Stringency* is the average stringency of potential syndicate partners measured in the previous year $(t-1)$. We include borrower, lead lender, and year fixed effects. To the extent that more funding from foreign participants improves a firm's access to debt financing, we conjecture that borrowers should increase their investment, expand employment, and observe increased sales, i.e., $\gamma_1 > 0$.

4.2.2 Results

Panel A of Table 5 reports the differences in borrower characteristics between syndicates with strictly regulated participants ("High") and loosely regulated participants ("Low"). The column "Difference" reports the differences between the two groups ("High − Low") together with the statistical significance of the differences. Results suggest that strictly regulated banks tend to participate in loans to smaller, less tangible, and unrated firms. These patterns reveal a riskier and more opaque borrower base.

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[14]We restrict our sample to pairs of U.S. public borrowers and U.S. lead banks and only consider pairs that have multiple loans and whose relationships extend more than four years.

TABLE 5 ABOUT HERE

Panel B reports regression results for loan spreads in Columns (1) and (2), and for loan default in Columns (3) and (4). Column (1) presents results for *%Foreign Participants*, the percentage of foreign participants over the total number of participants in a syndicate. This measure attracts a positive and significant coefficient, suggesting that a one-standard-deviation increase in foreign participation (30%) is associated with 10 basis points higher spreads. This result underlines a general pattern that globally syndicated loans on average deliver higher returns to participant banks. The estimate in Column (2) features a positive, significant effect of the capital regulation stringency of participant banks on loan spreads. The coefficient indicates that a one-standard-deviation increase in participants' capital stringency is associated with 2.2 basis points higher spreads on the loan contract. Column (3) shows that globally syndicated loans have worse performance, as is evidenced by a 5% higher default rate for a one-standard-deviation increase in foreign participation. Column (4) continues to report a positive and significant coefficient on participant stringency, providing evidence that strictly regulated banks participate in riskier loan deals that exhibit poor ex post performance.

Table 6 reports the results for borrowers' investment, employment, and sales. Estimates in Panel A suggest that a one-standard-deviation increase in the participant stringency is associated with a 18% increase in investment, 11% higher employment, and 8% higher sales growth. The economic magnitudes of these effects are sizable considering the fixed effects we impose in the estimation. Panel B further shows that the improvement in sales and employment are concentrated on borrowers with high credit risk, indicated by the borrower having a speculative rating or no ratings. These results suggest that strict capital regulations may trigger increases in cross-border lending, affecting the policies and growth of risky firms abroad.

TABLE 6 ABOUT HERE

Overall, our analyses from this section provide supporting evidence for regulatory arbitrage hypothesis, which predicts that strictly regulated banks participate in riskier loans abroad to achieve a higher return on capital. Notably, the regulatory arbitrage incentive of global syndication also facilitates firms' access to credit, especially for risky firms. As such, our results highlight the importance to understand banks' incentives in forming global syndicates, which can significantly influence the availability and the cost of credit for corporate borrowers.

4.3 Borrower-side Analyses

Our loan-level evidence shows that strictly regulated banks often invest in loans to riskier, more opaque borrowers. One may be concerned that our base results might be driven by unobservable borrower conditions such as credit demand or credit quality that could be correlated to the surge or decline in global syndication. To account for such possibilities, we design a test to examine banks' participation decision while controlling for time-varying borrower conditions.

Using the borrower-year-country sample, we examine the relation between capital stringency in a given country and the decision of its banks to participate in the syndicated loan. Formally, we estimate the following model:

$$Participate_{f,j,t} = \theta_1 Capital\ Stringency_{j,t} + \theta_2 Controls + \Gamma_{f,t} + \nu_{j,f,t}, \qquad (4)$$

where f indicates the borrower, j indicates a potential participant country, and t stands for the year. $Capital\ Stringency_{j,t}$ stands for the capital stringency of country j during year t. $Participate_{f,j,t}$ is an indicator variable that equals one if bank j is a syndicate participant in at least one of the loans extended to borrower f during year t. $Controls$ include the GDP growth rate and GDP per capita in bank j's country during year t. We also include $Ln(Distance)$ and $Common\ Language$ as controls. $Ln(Distance)$ measures the maximum distance between the geographical distance from the lead arranger country to the borrower country, and that from the participant country to the borrower country.

Common Language takes the value of one if the lead country, borrower country, and the participant country share the same language, and zero otherwise.

The key feature of this test is that we control for borrower-year fixed effects ($\Gamma_{f,t}$) to fix the credit conditions of the borrower. We further introduce lead country-year fixed effects to hold constant the regulation faced by the lead arranger. If banks under strict capital regulations are incentivized to syndicate abroad, we expect that $\theta_1 > 0$.

Table 7 reports the result from this estimation. Column (1) shows the effect of capital regulation on banks' participation decisions controlling for borrower-year fixed effects. Column (2) adds country-level control variables. Columns (3) and (4) repeat the tests in Columns (1) and (2) while adding lead country-year fixed effects. Across all models, capital stringency bears a positive and significant coefficient. The estimates from Column (1) suggest that a one-standard-deviation increase in the capital regulation stringency of a foreign country is associated with around a 0.7-percentage-point increase in the participation of its banks. This effect represents a 14% increase compared to the average participation rate of only 4.8 percentage points. The coefficient drops to 0.001 once we control for participant country's characteristics, which still represents a nearly 4% relative increase in participation rates.

The results from the borrower-year-country panel regressions confirm our base finding that banks under stringent capital regulations are more likely to participate in loans initiated by less regulated banks, and that this finding is unlikely to be driven by borrower-side credit demand.

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TABLE 7 ABOUT HERE

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5 Additional Analyses

We conduct several additional analyses to corroborate our argument that banks participate in global syndicates to circumvent stringent regulations in their home countries. We start by exploring bank and country characteristics that could modulate the relation between differences in capital regulation and syndication activities. Next, we attempt to

address concerns related to reverse causality using a set of instrumental variables that has been shown to generate variations in bank regulations (Houston et al. 2012). We then consider an alternative explanation for our findings. Finally, we compare the tendency of strictly regulated banks to become the lead arranger or a participant of a foreign deal.

5.1   Cross-sectional Analyses

We explore bank or country characteristics that could alter the incentives of banks in participating in global syndicates. To start, we consider banks' capital adequacy, measured by the ratio of Tier-1 capital over risk-weighted assets. If banks participate in global syndicates to circumvent stringent capital requirements, we should observe this activity to be more pronounced among capital-constrained banks, i.e., banks with lower Tier-1 capital ratios. Additionally, we examine two factors that can mitigate the relation between capital stringency and global syndication participation. The first factor is a country's quality of legal institution. This is measured by the Worldwide Governance Indicator (WGI), which is the principal component of six governance indicators, including voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption (Kaufmann et al. (2011)). If a country has strong governance, its capital regulation is more likely to be strongly enforced. The second factor is accounting quality. Higher accounting quality can reduce the information asymmetry between banks and regulators, as banks are subject to more frequent and stringent external audit, and are required to publish detailed and transparent financial statements. Both stronger governance and greater accounting quality should impose a greater barrier for banks to circumvent capital regulation.

We regress syndicate activities on the full interaction between capital regulation of participant banks (*Participant Stringency*) and the conditioning variables, including a participant bank's Tier-1 capital ratio (*Tier-1 Capital*), and the WGI index (*Governance Index*) and the accounting standards (*Accounting Quality*) of the participant bank's country. In our estimation, we control for lead-bank-year fixed effects to hold fixed the regulation stringency faced by lead banks.

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Table 8 reports the results. For brevity of display, we only report results for *%Syndicate*, although the dummy variable, *Syndicate*, generates qualitatively similar results. The coefficient on the interaction term between *Participant Stringency* and *Tier-1 Capital* is negative and statistically significant, indicating that strictly regulated banks are more likely to participate in global syndicates when they are capital constrained.

The interaction term between *Participant Stringency* and *Governance Index* also attracts a negative and significant coefficient, confirming our conjecture that banks in countries where regulations are strictly enforced are less likely to conduct regulatory arbitrage activities. Finally, we find a negative coefficient for *Participant Stringency × Accounting Quality*, consistent with our argument that high-quality bank accounting helps inhibit banks' regulatory arbitrage activities.

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TABLE 8 ABOUT HERE

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Results from our cross-sectional analyses help pinpoint the factors that alleviate banks' regulatory arbitrage incentives. We find that banks are less likely to conduct regulatory arbitrage through global syndication if they have sufficient capital, face strict enforcement of regulations, and are required to meet high-quality accounting standards.

5.2   An Instrumental Variable-based Estimation

Our baseline estimations generate consistent findings with the regulatory arbitrage hypothesis. However, reverse causality remains a concern if cross-border syndication activities can influence the differences in capital regulations across countries. Granted that it is challenging to find perfectly exogenous changes in capital regulations, we attempt to alleviate this concern using an IV-based estimation. Following previous literature (Houston et al. (2012) and Karolyi and Toboaba (2015)), we select instruments that reflect the geographical and ethnic endowment of a given country, together with other historical and social traits. Specifically, we use the latitude, ethnic fractionalization, and income inequality of a country. We also calculate the percentage of years that a country has been independent since 1776. Finally, we include in our set of instruments an indicator

for whether the central bank is the only supervisor in a given country.

Using these instruments, we conduct two-stage-least-square regressions. In the first stage, we regress the difference in capital regulation on the differences in instrumental variables between two countries. In the second stage, we regress syndication activities on the capital regulation differentials that are predicted by the first stage. Table 9 presents the results. The IV approach yields similar results as our baseline estimations, with the predicted differences in capital regulation ($\Delta \widehat{Capital\ Stringency}$) attracting positive and statistically significant coefficients for syndication activities. These results confirm our argument that strictly regulated banks are more likely to participate in global lending syndicates originated by loosely regulated lead banks.

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5.3 An Alternative Explanation

An alternative explanation for the relation between global syndication and capital regulation differentials that we document is that lead banks prefer to select strictly regulated banks, because those banks often have healthier balance sheets and are more resilient to negative shocks. Previous studies document that syndicate partnerships are repeated relationships that involve future cooperation for renegotiation (Robert and Sufi (2009)) and reciprocal deals (Cai (2010)). Moreover, negative capital shocks to one syndicate member could result in a contagion effect across all lenders in the syndicate (Nirei et al. (2016)). Expecting long-term syndication relationships, lead lenders might prefer to share credit risks with strictly regulated banks (*risk-sharing* hypothesis).

To distinguish between the regulatory arbitrage hypothesis and the risk-sharing hypothesis, we separately estimate the effect of capital stringency faced by lead lenders and participant lenders. According to the risk-sharing hypothesis, strictly regulated lead banks should be more incentivized to share credit risk with foreign banks, thus more likely to arrange global syndicates.

Table 10 reports the results. The capital stringency in the lead lender's country is

negatively associated with global syndication, suggesting that a tighter capital regulation discourages banks from distributing loan deals to foreign banks. Notably, the capital regulation of participant countries generates a stronger effect than the lead country's regulation. This implies that participants' choices of lending syndicates play a more important role in shaping the global syndication structure than lead lenders' choices of participants. These results are at odds with the risk-sharing hypothesis.

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TABLE 10 ABOUT HERE

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5.4   Choice of Leading and Participation

As banks consider cross-border lending, they may choose to directly originate a syndicated loan instead of participating in one. We argue that it might be costly for a bank to directly arrange a syndicated loan to foreign borrowers. Doing so exposes the bank to significant adverse selection risks because the bank faces a greater degree of information asymmetry in screening and monitoring foreign borrowers. Being a lead lender, banks also need to hold a bigger share of the loans on their balance sheet and face more reputation damage if the borrower defaults on the loan (Irani and Meisenzahl (2017) and Gopalan et al. (2011)). Due to these reasons, we expect strictly regulated banks to be more likely to participate in a foreign-led syndicate rather than to arrange a loan to a foreign borrower. We directly test this choice using a borrower-level sample similar to the one used in Section 4.3. For each borrower-year observation, we only include countries whose banks lend to the borrower either as a lead arranger or as a participant. This allows us to hold constant borrower-side conditions and compare banks' decisions between leading vis-à-vis participating in a foreign syndicate.

Table 11 presents the results. The dependent variable is *Participate*, which equals one if a bank is a syndicate participant in lending to the borrower, and zero if the bank is a lead arranger. Column (1) includes borrower-year fixed effects to control for the conditions related to credit quality or credit demand of the borrowers. Column (2) further controls for banks' home country fixed effects. Column (3) adds characteristics

of banks' home country. Across all specifications, the capital stringency in the bank's country generates positive coefficients, suggesting that when a bank is subject to stringent capital regulations, it is more likely to join a foreign-led syndicate as a participant rather than to directly extend a loan as a lead arranger. The estimation from Column (3) indicates that a one-standard-deviation increase in capital stringency is associated with a 2-percentage-point greater likelihood that the bank will participate in rather than lead a lending syndicate.

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TABLE 11 ABOUT HERE

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6 Robustness

We end our investigation with a number of robustness analyses, including examining measurement errors in banking regulations and syndicate activities, addressing sampling issues related to the location of lead lenders and participants, and considering alternative dimensions of banking regulations.

6.1 Measurement

6.1.1 Effects from the Approval of Internal Rating-Based Models

The banking regulation index that we use for our analyses are based on surveys conducted at regular intervals. It does not reflect the exact timing of regulation changes. To overcome this limitation, we take advantage of the discrete timing that banks receive regulatory approval to use internal-rating based (IRB) models following Basel II. As countries shift their regulatory regimes from Basel I to Basel II Accord, banks that obtain regulatory approval to use IRB models are allowed to assign internal ratings to their asset risk when estimating the weight of each asset class.

Basel II capital regulation generally allows more flexibility to banks' capital reserves and reduces the required capital reserves for an average bank (Behn, Haselmann, and Vig (2016) and Barth et al. (2013)). We thus expect that following IRB approval, banks

are subject to less stringent capital standards and are less likely to participate in global syndicates led by loosely regulated banks. Following Mariathasan and Merrouche (2014), we examine the changes in syndicate participation around the IRB approval for 79 banks from 22 countries. We construct a bank-year-country panel, examining the decision of the 79 banks to participate in foreign-led loan syndicates around their IRB approval. The event window includes four years before and after the approval of IRB, excluding the year of the approval.

We regress the global syndication activity of our sample banks on the full interaction of an indicator for IRB approval (IRB) and the capital regulation stringency in a lead lender's country. Table 12 shows the results. The interaction term attracts negative, significant coefficients. This finding provides additional support of our baseline results. As banks face a more relaxed capital regulation, they engage in less global syndication activities and are less likely to participate in syndicates led by loosely regulated banks. Furthermore, the main effect of IRB approval also generates a negative coefficient, suggesting that banks reduce their engagement in all global syndication activities following IRB approval.

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TABLE 12 ABOUT HERE

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6.1.2 Syndicate Shares

Our measures of syndication activity rely on counting the number of loans instead of the dollar amount contributed by each participant banks. This is because Dealscan only provides sparse information regarding lenders' shares (only for 27% of deals). Nevertheless, with the information available, we construct an alternative measure of syndication activity using the amount of capital contributed by participant banks. Specifically, we compute the proportion of loan amount originated by a lead bank that is contributed by a certain participant bank in a given year (*Syndicate Share*). This measure complements our main measures by gauging directly the capital investment by banks. Table 13 shows that greater differences in capital regulations are associated with strictly regulated banks

investing more capital into syndicates originated by less regulated banks. This confirms our base findings that banks can conduct regulatory arbitrage through global syndication.

TABLE 13 ABOUT HERE

6.2 Sampling

6.2.1 Location of Lead Lenders

We argue that banks participate in syndicates led by loosely regulated banks, because those lead arrangers may have greater expertise in scouting out risky borrowers. This argument should be particularly pertinent to the cases where the lead lender is located in the same country as the borrower. We reconstruct our bank-level sample using only loans that satisfy this criteria and repeat our baseline test.[15] Columns (1) and (2) in Panel A of Table 14 report the results. For both measures of syndication activity, we find that greater differences in capital stringency between participant and lead countries continue to be associated with more syndication activity.

TABLE 14 ABOUT HERE

6.2.2 Existence of Foreign Subsidiaries

We next address the possibility that banks may set up subsidiaries in countries with lax regulations (Frame et al. (2017)). As we attribute lending by subsidiaries to the ultimate parent bank, we take into account the possibility that banks may issue loans through their subsidiaries. However, there may be cases where banks set up subsidiaries for reasons other than, but correlated with regulation differentials across countries. To alleviate potential concerns related to these reasons, we control for the existence of foreign subsidiaries. Columns (3) and (4) of Panel A show that our baseline result persists when we control for whether the participant bank has subsidiaries in the lead lender's country and whether the lead lender has subsidiaries in the participant's country. Notably, the

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[15]The majority of loans in our sample (83%) have lead arrangers in the same country as the borrower.

coefficient of Δ *Capital Stringency* increases by around 30% in magnitude, suggesting that controlling for subsidiaries may have reduced noises in the estimation.

6.2.3   Non-U.S. Lenders

Panel B of Table 14 repeats the baseline estimations using a sample of non-U.S. banks. This helps address the concern that the behavior of U.S. banks may dominate our findings. Excluding U.S. banks reduces the sample by about 30%, but it generates similar results as those in Table 3. A one-standard-deviation increase in capital regulation differential is associated with a 0.5-percentage point increase in the likelihood of syndication between two banks, and a 0.07-percentage point increase in relative syndication intensities. These effects account for around 2–3% changes relative to the average syndication activities.

6.3   Effects from Other Risk-Inducing Regulations

In the last step of our analyses, we consider two other regulations that might induce banks' risk-taking behaviors across border. The first is regulatory restrictions on the entry into the banking sector (*Entry Requirement*). Stricter requirements for new bank entry reduce competition faced by incumbent banks, thus alleviating the pressure for banks to bear higher credit risk to achieve profits. Accordingly, we expect stricter entry requirement to be negatively correlated with banks' participation in global syndicates.

The next dimension is the deposit insurance coverage ratio (*Funding Insured*). Deposit insurance intensifies potential moral hazard problems, whereby depositors do not have strong incentives to monitor banks' activities (Demirgüç-Kunt and Kane (2001)). Therefore, banks in countries with high deposit insurance may conduct more risky lending activities than is desirable to regulators (e.g., Demirgüç-Kunt and Detragiache (2002) and Laeven (2002)). As such, we expect that banks from countries with a greater coverage of deposit insurance are more likely to participate in global syndicates.

Table 15 reports the results. Columns (1) through (4) examine the effect of entry requirement and Columns (5) through (8) report the results for funding insurance. For each aspect of regulation, we report results for the likelihood of syndicate (*Syndicate*)

and syndication intensity (*%Syndicate*) in turn.

Across all specifications, differences in bank entry requirement generate negative and significant coefficients, suggesting that banks who face more competitive pressure (low entry requirements) are more likely to participate in global syndication. A one-standard-deviation increase (1.11) in the difference between the entry requirement in participant and lead countries is associated with a 0.4-percentage point decrease in global syndication activities, and about a 0.16-percentage point decrease in the proportion of loans that a lead lender will syndicate with a participant bank. This is consistent with the hypothesis that competition within the banking industry intensifies the risk-taking incentives of incumbent banks, leading them to seek more syndication deals originated by loosely regulated countries.

We also find a positive association between funding insurance and banks' participation in foreign-led syndicates. This result is in support of the notion that deposit insurance may breed moral hazard, i.e., banks are less concerned about downside risks, thus taking a higher level of risk than is desirable to regulators. A one-standard-deviation increase (0.29) in the difference of funding insurance is associated with 1 percentage point higher likelihood that a bank will participate in the global syndication deal.

These results corroborate our base findings that global syndication is affected by risk-taking incentives induced by banking regulation. Once shareholders' desired risk level deviates from the risk level stipulated by regulators, banks can engage in globally syndicated lending to circumvent regulations.

7   Conclusion

Global syndication has become a common practice in the market for corporate loans. Despite the increasing popularity, the determinants and implications of global syndication remain under-explored in the literature, which generally focuses on the dynamics between

borrowers and lenders while taking the syndicate structure as given. This study aims to fill the gap by investigating how differences in capital regulation stringency across countries may affect the structure of global syndicates.

We find evidence consistent with a regulatory arbitrage incentive of banks in participating in global lending syndicates. First, we document a robust pattern that strictly regulated banks participate more in lending syndicates initiated by lead banks that are subject to less stringent regulations. This pattern persists when we hold fixed the pairing between participant and lead banks or any demand-side conditions. Global syndicates that involve more strictly regulated participants are associated with a riskier borrower base, higher interest rate markups, and poor-performing loans. These findings suggest that banks, when facing strict capital regulations, seek risky, yet profitable investments by partnering with lead banks under loose regulations, who often have an expertise in identifying riskier borrowers.

Our study is the first to document the relation between cross-country differences in banking regulations and global syndication activities. Importantly, we highlight the implications of global syndication on the funding costs of corporate borrowers as well as on banks' asset risks. Our study thus suggests that the dispersion in banking regulations across countries engenders an economically important effect on bank stability and corporations' access to credit.

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Appendix A   Variable Definitions

- Syndication Activity (Source: Dealscan)

  $Syndicate_{i,j,t}$: Indicator variable equal to one if there is more than one syndicate loan issued in which bank i is the lead lender and bank j is a participant in year t and zero otherwise.

  $\%Syndicate_{i,j,t}$: The number of loans issued between two banks in which bank i is the lead lender and bank j is the participant in year t as a proportion of the total number of loans led by bank i in year t.

- Bank Regulations (Source: Barth, Caprio, and Levine (2013))

  Capital Stringency: Index that measures the stringency of regulations on the capital reserve banks must hold and on the sources of funds that count as regulatory capital. A higher value indicates higher stringency.

  Entry Requirement: Index that measures the extent to which various types of legal submissions are required to obtain a banking license. A higher value indicates stronger stringency to limit competitions.

  Funding Insured: Percent of the commercial banking system's assets is funded with insured deposits. A higher value indicates higher degree of moral hazard.

- Country-level Variables (Source: World Bank)

  GDP per Capita: Log of real GDP per capita in US dollars.

  GDP Growth: The annual real growth rate of GDP.

  Ln(Distance) : Log of circle distance between the capital cities of two countries.

  Common Language: Indicator variable equal to one if the two countries share the same language and zero otherwise.

  Governance Index: The principal component of six governance indicators including voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption (Source: the Worldwide Governance Indicator project)

  Accounting Quality: Index that measures the informativeness of bank accounting. A higher value indicates more informative bank account (Source: Barth, Caprio, and Levine (2013))

- Bank-level Variables

  Prior Lead: Log of the total number of loans that are led by a specific lender in previous three years. (Source: Dealscan)

  Prior Participant: Log of the total number of loans in which a specific lender participates in the previous three years. (Source: Dealscan)

  Prior Syndication: Indicator variable equal to one if a bank pair has issued one or more loans together in previous three years and zero otherwise. (Source: Dealscan)

  Bank Size: Log of total assets of a bank. (Source: Bankscope)

Bank ROA: Return on average total assets of a bank. (Source: Bankscope)

Tier-1 Capital: The ratio of Tier-1 capital to risk-weighted assets. (Source: Bankscope)

- Borrower-level Variables (Source: Compustat)

  Size: Log of total assets (AT)

  Tangibility: Property, plant, and equipment (PPENT)/total assets (AT)

  Profitability: Operating income (OIBDP)/total assets (AT)

  Rating: A dummy variable that equals one if the borrower has S&P credit rating, and zero otherwise

  M/B: Market to book ratio. [Total assets (AT)-Book value of equity (CEQ)+Market value of equity (PRCC_F×CSHO)]/Book value of equity (CEQ)

  Investment: Capital expenditure(CAPX)/total assets (AT)

  Employment: Log of number of employees (EMP)

  Sale: Log of sales (SALE)

- Loan-level Variables (Source: Dealscan)

  Loan Spread: All-in-drawn loan spread over LIBOR

  Loan Default: Indicator variable equal to one if the borrower receives default ratings from S&P during the course of the loan

  Loan Maturity: Loan maturity in months

  Loan Covenants: Total number of covenants on the loan package

  Loan Size: Log of the loan amount in US dollar

  Loan Facilities: The number of facilities within a loan package

  %Foreign Participants: The number of foreign participant as the proportion of total number of participant banks in a syndicate

Table 1

Summary Statistics for Global Syndication Activity

This table shows the summary statistics for loan syndication activities by country. The sample includes 114,992 loans issued by banks from 44 countries during the period of 1995 through 2016. Columns (1) through (4) summarize the overall syndicated lending by banks in each country. Column (1) reports the total number of loans extended by banks in a country, Column (2) presents the total dollar amount of loans (in $US billion), Column (3) describes the number of lead lenders in each country, and Column (4) describes the number of participant banks in a country. Columns (5) to (7) provide summary statistics for the structure of global syndicates originated by banks in each country. Column (5) shows the percentage number of loans that include at least one foreign participant bank over all the loans originated by banks in a given country. Column (6) shows the percentage dollar amount of loans contributed by foreign participant banks. When loan share of each lender is missing, we assume all lenders contribute equally. Column (7) shows the average number of foreign participants as the proportion of total number of participants in lending syndicates originated by bank in each country.

Country	(1) #Loans	(2) Loan Amount ($US Bil)	(3) #Lead Banks	(4) #Participants	(5) %Globally Syndicated Loans	(6) %Contributed by Foreign Banks	(7) %Foreign Participants
Argentina	288	52.9	16	29	93.3	74.2	93.3
Australia	2,030	753.1	11	18	89.9	27.2	78.8
Austria	61	41.2	20	38	97.3	22.4	89.7
Belgium	182	174.9	9	17	99.7	23.2	97.4
Brazil	614	198.1	23	41	89.3	27.1	79.8
Canada	5,101	2,297.4	10	24	82.4	35.7	66.0
Chile	283	72.4	7	12	92.9	23.5	77.5
China	2,507	272.3	16	197	44.6	20.2	39.1
Czech Republic	91	15.0	4	8	100.0	31.4	97.5
Denmark	119	79.4	10	15	99.6	28.5	97.3
Finland	180	103.2	3	6	94.1	19.7	93.4
France	1,803	1,323.0	32	67	92.7	32.5	83.5
Germany	1,309	1,247.8	39	273	94.8	32.2	82.8
Greece	205	55.6	10	21	98.0	28.2	89.5
Hong Kong	1,539	203.9	17	28	97.4	14.3	88.6
Hungary	140	35.3	9	12	94.9	24.3	92.7
India	1,519	138.8	12	67	31.6	13.8	23.8
Indonesia	816	104.3	18	62	68.0	13.7	53.1
Ireland	216	191.2	3	7	98.8	22.4	96.4
Italy	784	541.6	42	150	91.1	24.4	82.2
Japan	22,644	219.0	69	527	23.1	30.4	19.5

Kazakhstan	131	22.1	2	100.0	7	52.3	98.8
Luxembourg	237	280.5	7	100.0	15	20.9	98.7
Malaysia	448	60.9	11	81.5	34	15.9	73.2
Mexico	631	252.0	7	95.4	16	26.7	88.9
Netherlands	680	568.1	10	99.2	24	32.4	96.5
Norway	329	91.8	7	97.6	13	30.5	94.4
Philippines	349	65.0	12	70.6	30	14.8	53.8
Poland	136	35.8	7	90.5	20	30.2	80.1
Portugal	78	38.5	8	98.2	14	27.2	93.2
Russia	644	274.1	11	95.9	49	16.4	89.3
Saudi Arabia	80	113.6	13	89.3	16	23.4	80.3
Singapore	625	214.5	7	98.7	12	22.8	94.7
South Africa	170	60.0	5	96.5	10	23.5	93.5
South Korea	1,407	161.5	30	67.0	72	21.0	53.4
Spain	921	668.6	70	89.8	148	23.5	75.7
Sweden	297	157.5	6	99.1	10	27.4	94.4
Switzerland	433	642.7	18	98.7	48	35.7	96.1
Taiwan	2,854	87.5	12	30.1	65	6.7	13.1
Thailand	536	48.5	10	72.4	22	18.3	60.2
Turkey	497	214.7	23	97.4	35	22.7	92.0
United Arab Emirates	195	136.2	6	90.1	23	20.7	82.6
United Kingdom	2,517	2,414.1	22	97.3	43	34.9	91.5
United States of America	58,366	27,313.9	424	67.4	1142	32.8	42.0

Table 2
Summary Statistics for Capital Stringency and Global Syndication Measures
This table presents the summary statistics for our variables of interest. Panel A reports the summary statistics for capital stringency and measures of global syndication activities. Panel B presents the average value of capital stringency for each country over the available surveys. Capital stringency index is obtained from surveys conducted by Bath, Caprio, and Levine (2013).

Panel A: Summary Statistics of Capital Stringency Measure

	Mean	Median	Std. Dev.
Capital Stringency	4.19	4.00	1.72
Syndicate	0.25	0	0.43
%Syndicate	2.19	0	7.21

Panel B: Average Capital Stringency by Country

Country	#Surveys	*Capital Stringency*
Argentina	4	4.5
Australia	4	6.3
Austria	4	4.5
Belgium	4	4.6
Brazil	4	3.0
Canada	4	2.8
Chile	4	3.0
China	4	4.0
Czech Republic	3	2.0
Denmark	4	4.8
Finland	4	4.3
France	4	4.5
Germany	4	5.3
Greece	4	4.0
Hong Kong	4	4.7
Hungary	4	3.5
India	4	4.5
Indonesia	4	4.7
Ireland	4	4.7
Italy	4	3.1
Japan	3	3.0
Kazakhstan	4	3.3
Luxembourg	4	5.0
Malaysia	4	1.8
Mexico	4	4.4
Netherlands	4	4.5
Norway	4	5.0
Philippines	4	4.8
Poland	4	4.0
Portugal	4	4.5
Russia	4	5.0
Saudi Arabia	3	2.7
Singapore	4	6.0
South Africa	4	4.3
South Korea	4	4.0
Spain	4	6.0
Sweden	3	2.0
Switzerland	4	4.8
Taiwan	4	3.7
Thailand	4	3.3
Turkey	4	4.2
United Arab Emirates	4	4.5
United Kingdom	4	5.3
United States of America	4	4.8

Table 3

Effect of Capital Regulations on Syndication Activities

This table shows the relation between syndication activities between countries and the differences in capital regulation stringency. The dependent variable in Columns (1) and (2) is *Syndicate*, the indicator for syndication between two banks. The dependent variable in Columns (3) and (4) is *%Syndicate*, the number of syndicated loans between two banks scaled by the total number of loans extended by the lead bank. Capital stringency index is obtained from surveys conducted by Bath, Caprio, and Levine (2013). Definitions of all variables are provided in Appendix A. The regressions are conducted on a bank-pair-year panel, spanning the period from 1995 through 2016. Columns (1) and (3) control for year fixed effects, lead-country fixed effects, and participant-country fixed effects. Columns (2) and (4) control for year fixed effects, lead-bank fixed effects, and participant-bank fixed effects. Standard errors are clustered by country-pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.:	*Syndicate*		*%Syndicate*	
	(1)	(2)	(3)	(4)
Δ*Capital Stringency*	0.005***	0.005***	0.027	0.051***
	(2.99)	(2.59)	(1.54)	(3.02)
Δ*GDP per Capita*	0.018	0.011	0.066	0.072
	(1.49)	(0.98)	(0.47)	(0.58)
Δ*GDP Growth*	0.121***	0.137***	-0.461	0.108
	(2.60)	(2.89)	(-0.69)	(0.17)
Ln(Distance)	-0.024***	-0.061***	-0.471***	-0.688***
	(-10.89)	(-22.42)	(-11.23)	(-17.18)
Common Language	0.005	0.021**	0.176	0.135
	(0.53)	(2.03)	(1.55)	(1.25)
Year FE	Yes	Yes	Yes	Yes
Lead, Participant Country FE	Yes	No	Yes	No
Lead, Participant Bank FE	No	Yes	No	Yes
Observations	766,686	766,439	766,686	766,439
Adjusted R^2	0.06	0.22	0.03	0.15

Table 4

Effects of Capital Regulations on the Syndication: Within-Bank-Pair Analyses

This table shows results from within-bank-pair analyses of syndication activities and cross-country differences in capital regulation stringency. The dependent variable is the relative extent of syndication activities between two banks, *%Syndicate. Prior Syndication* is an indicator variable that equals one if a pair of banks have issued one or more loans over the previous three years, and zero otherwise. Capital stringency index is obtained from surveys conducted by Bath, Caprio, and Levine (2013). Bank characteristics are sourced from Bankscope. Definitions of all variables are provided in Appendix A. The regressions are conducted on a bank-pair-year panel, spanning the period from 1995 through 2016. All regressions include year fixed effects and bank-pair fixed effects. Standard errors are clustered by country-pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: *%Syndicate*	(1)	(2)	(3)
Δ*Capital Stringency*	0.027*	-0.040**	-0.092***
	(1.65)	(-2.25)	(-4.55)
Δ*Capital Stringency* $\times$ *Prior Syndication*		0.094**	0.235***
		(2.27)	(5.45)
Prior Syndication		5.010***	4.574***
		(30.16)	(22.35)
Δ*GDP per Capita*	-0.013	-0.106	0.150
	(-0.10)	(-1.15)	(1.12)
Δ*GDP Growth*	-0.022	-1.345**	-0.679
	(-0.03)	(-2.41)	(-0.67)
Prior Lead	0.153***	-0.601***	-0.508***
	(5.05)	(-15.67)	(-8.64)
Prior Participant	0.709***	0.043*	-0.046
	(20.54)	(1.69)	(-1.03)
Δ*Bank Size*			-0.007
			(-0.14)
Δ*Bank ROA*			0.913
			(0.72)
Year FE	Yes	Yes	Yes
Bank-Pair FE	Yes	Yes	Yes
Observations	684,549	666,281	152,936
Adjusted R^2	0.16	0.25	0.27

Table 5

Capital Regulations, Borrower Characteristics, and Loan Terms

This table examines the relationship between the capital regulation faced by syndicate participants, borrower characteristics, and loan terms. The sample contains globally syndicated loans to U.S. public borrowers during the period of 1995 through 2016. Panel A compares the characteristics of borrowers between loans extended by strictly regulated participants (higher than the U.S.) and loosely regulated participants (lower than the U.S.). Panel B examines loan spreads and performance conditional on borrower characteristics. The dependent variable in Columns (1) and (2) is *Loan Spread*, the all-in-drawn interest rate spread in basis points over LIBOR. The dependent variable in Columns (3) and (4) is *Loan Default*, an indicator variable that equals one if the borrower drops to default ratings by S&P during the course of the loan, and zero otherwise. Definitions of all variables are provided in Appendix A. All regressions include year fixed effects, borrower-industry fixed effects, and lead-country fixed effects. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Borrower Base

Participant Capital Stringency	High	Low	Difference (High − Low)
Borrower Size	6.952	7.418	-0.467***
Borrower Tangibility	0.321	0.337	-0.016***
Borrower Rating	0.352	0.437	-0.085***

Panel B: Loan Spreads and Performance

Dep. Var.:	Loan Spread		Loan Default	
	(1)	(2)	(3)	(4)
%Foreign Participants	30.106***		0.176***	
	(13.13)		(8.48)	
Lead Stringency		2.577		0.026
		(0.65)		(0.97)
Participant Stringency		1.275***		0.014***
		(3.96)		(3.02)
Borrower Size	-27.509***	-25.337***	-0.072***	-0.075***
	(-23.94)	(-21.47)	(-8.25)	(-7.13)
Borrower Profitability	-271.402***	-264.998***	-1.556***	-1.697***
	(-11.33)	(-9.45)	(-16.19)	(-15.81)
Borrower Tangibility	27.065***	31.520***	0.263***	0.302***
	(6.11)	(7.93)	(9.09)	(8.57)
Borrower Rating	28.232***	25.110***	0.232***	0.251***
	(28.20)	(40.26)	(8.51)	(8.52)
Loan Maturity	0.305***	0.336***	0.007***	0.008***
	(11.15)	(9.17)	(12.08)	(13.63)
Loan Convenants	6.539***	7.494***	0.010**	0.009*
	(26.38)	(28.66)	(2.37)	(1.82)
Loan Size	-12.489***	-12.530***	0.049***	0.057***
	(-7.75)	(-6.11)	(4.09)	(3.99)
Loan Facilities	33.876***	34.314***	0.471***	0.482***
	(23.43)	(23.83)	(19.07)	(17.59)
Year FE	Yes	Yes	Yes	Yes
Borrower Industry FE	Yes	Yes	Yes	Yes
Lead Country FE	Yes	Yes	Yes	Yes
Observations	28,494	25,288	28,389	25,198
Adjusted R^2	0.49	0.50	0.09	0.09

Table 6

Real Effects of Participants' Capital Regulation

This table shows the effects of the capital regulation stringency of participant bank countries on corporate policies of the U.S. borrowers. The test uses a borrower-lead lender-year panel. The sample only includes U.S. borrower-lead lender pairs that have multiple loans and the relationship extend more than four years. The variable of interest is *Participant Stringency*, the average stringency of capital regulation from potential syndicate participants. For each lead lender, we identify its prospective participants as banks that have participated in loans initiated by the lead lender to U.S. firms during the previous year. *Participant Stringency* is lagged by one year. Panel A examines the average effect of capital stringency on borrowers' operating policies, and Panel B examines the interactive effect of capital stringency and borrower risk. *High Risk* indicates borrowers without credit ratings or with a speculative-grade rating. In both panels, Column (1) examines the effect of participants' capital regulation on borrowers' investment, Column (2) examines the log number of employees, and Column (3) examines the log of sales. All regressions include borrower, year, and lead-bank fixed effects. Standard errors are clustered by borrower. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Changes in Borrowers' Policies

Dep. Var.:	(1) *Investment*	(2) *Employment*	(3) *Sales*
Participant Stringency	0.006**	0.065*	0.046**
	(1.98)	(1.95)	(2.18)
Borrower Size	-0.002	0.691***	0.739***
	(-1.21)	(40.68)	(46.29)
Borrower Profitability	0.075***	0.491***	1.948***
	(7.49)	(5.47)	(22.15)
Borrower M/B	-0.000	0.002	0.002
	(-0.32)	(1.37)	(1.57)
Borrower FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes
Observations	18,589	18,262	18,657
Adjusted R^2	0.75	0.98	0.99

Panel B: Interactive Effects with Borrower Risk

Dep. Var.:	(1) *Investment*	(2) *Employment*	(3) *Sales*
Participant Stringency	0.006**	0.020	-0.002
	(2.15)	(0.55)	(-0.08)
High Risk	-0.005	-0.156***	-0.172***
	(-1.23)	(-2.82)	(-4.51)
Participant Stringency × High Risk	-0.000	0.027**	0.029***
	(-0.52)	(2.46)	(3.79)
Borrower Size	-0.002*	0.685***	0.732***
	(-1.70)	(40.56)	(46.77)
Borrower Profitability	0.073***	0.477***	1.930***
	(7.22)	(5.37)	(21.76)
Borrower M/B	-0.000	0.003	0.002*
	(-0.31)	(1.47)	(1.70)
Borrower FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Lead Bank FE	Yes	Yes	Yes
Observations	18,589	18,262	18,657
Adjusted R^2	0.75	0.98	0.99

Table 7
Syndicate Participation Controlling for Borrower Conditions
This table examines the participation of banks in a global syndicate while holding fixed borrower-side conditions. The sample is a borrower-year-country panel, including all borrowers in Dealscan that obtain at least one syndicated loan with face value over $100 million in a given year. We sample on all the countries outside of the borrower's location and the lead lender's country and treat banks in those countries as potential foreign participants. The dependent variable is *Participate*, a dummy variable that equals one if at least one bank in a given country participates in the syndicated deal extended to a given borrower during a given year. All regressions include borrower-year fixed effects. Columns (3) and (4) additionally include lead country-year fixed effects. *Ln(Distance)* measures the maximum over the geographical distance from the borrower to the lead lender and from the borrower to the participant bank. *Common Language* equals one if the lead lender, participant, and the borrower share the same language, and zero otherwise. Standard errors are clustered by borrower. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: *Participate*	(1)	(2)	(3)	(4)
Capital Stringency	0.004***	0.001***	0.004***	0.001***
	(32.32)	(5.18)	(32.74)	(5.92)
GDP Growth		-0.003***		-0.003***
		(-54.21)		(-53.22)
GDP per Capita		1.110***		1.094***
		(71.68)		(71.25)
Ln(Distance)		-0.033***		-0.035***
		(-51.63)		(-53.12)
Common Language		0.035***		0.036***
		(56.81)		(56.81)
Borrower × Year FE	Yes	Yes	Yes	Yes
Lead Country × Year FE	No	No	Yes	Yes
Observations	1,972,105	1,968,742	1,972,016	1,968,654
Adjusted R^2	0.08	0.11	0.08	0.11

Table 8
Cross-sectional Analyses
This table shows the effects of bank characteristics in modulating the relation between capital regulations and global syndication activity. The dependent variable is *%Syndicate*. Capital regulation stringency, conditioning variables, and control variables are all measured at the participant bank (country) level. Column (1) examines the interaction effect of capital regulation with a participant bank's capital sufficiency (*Tier-1 Capital*), Column (2) examines the interaction effect of capital regulation with a participant country's external governance (*Governance Index*), and Column (3) investigates the interaction effect of capital regulation with a participant country's accounting quality (*Accounting Quality*). Definitions of all variables are provided in Appendix A. The regressions are conducted on a bank-pair-year panel, spanning the period from 1995 through 2016. All regressions include lead-bank-year fixed effects. Standard errors are clustered by country-pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: *%Syndicate*	(1)	(2)	(3)
Participant Stringency	0.198***	-0.018	0.216*
	(3.89)	(-1.05)	(1.92)
Tier-1 Capital	-4.740**		
	(-2.51)		
Participant Stringency × Tier-1 Capital	-1.051**		
	(-2.42)		
Governance Index		0.279***	
		(3.61)	
Participant Stringency × Governance Index		-0.031*	
		(-1.95)	
Accounting Quality			0.032
			(0.21)
Participant Stringency × Accounting Quality			-0.062**
			(-1.97)
GDP per Capita	0.357***	0.358***	0.390***
	(12.01)	(15.92)	(17.89)
GDP Growth	3.699***	1.594**	1.343**
	(3.30)	(2.43)	(2.19)
Ln(Distance)	-0.533***	-0.445***	-0.408***
	(-11.10)	(-11.30)	(-10.15)
Common Language	0.127	0.051	0.100
	(0.74)	(0.38)	(0.74)
Lead Bank × Year FE	Yes	Yes	Yes
Observations	265,692	751,593	824,622
Adjusted R^2	0.22	0.22	0.22

Table 9
Instrumental Variable Analyses
This table shows results from instrumental-variable regressions. The regressions are conducted in two stages. The dependent variable in the first stage is Δ *Capital Stringency*, and the dependent variables in the second stage are *Syndicate* and *%Syndicate*. $\Delta\widehat{Capital\ Stringency}$ indicates the difference in capital regulatory stringency between two countries that is predicted from the first stage. The instruments include between-country differences in latitude, ethnic fractionalization, income inequality (measured by Gini index), the percentage of years of that a country has been independent since 1776, and whether central bank is the only supervisor over banks in a country. Capital stringency index is obtained from surveys conducted by Bath, Caprio, and Levine (2013). The regressions are conducted on a bank-pair-year panel, spanning the period from 1995 through 2016. Standard errors are clustered by country-pair. Robust t-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.:	*Syndicate*		*%Syndicate*	
	(1)	(2)	(3)	(4)
$\Delta\widehat{Capital\ Stringency}$	0.019***	0.020**	0.085	0.120*
	(2.79)	(2.49)	(1.31)	(1.79)
$\Delta GDP\ per\ Capita$	-0.020	-0.032*	-0.129	-0.160
	(-1.08)	(-1.68)	(-0.71)	(-0.96)
$\Delta GDP\ Growth$	0.328***	0.363***	2.064*	2.741***
	(4.00)	(4.36)	(1.95)	(2.76)
$Ln(Distance)$	-0.029***	-0.070***	-0.516***	-0.694***
	(-11.37)	(-23.58)	(-10.99)	(-17.01)
Common Language	0.004	0.023**	0.206	0.161
	(0.47)	(2.03)	(1.61)	(1.35)
Year FE	Yes	Yes	Yes	Yes
Lead, Participant Country FE	Yes	No	Yes	No
Lead, Participant Bank FE	No	Yes	No	Yes
Hansen's J-statistics (p-value)	0.93	0.97	0.24	0.92
LM statistics (p-value)	< 0.01	< 0.01	< 0.01	< 0.01
F-statistics (p-value)	< 0.01	< 0.01	< 0.01	< 0.01
Observations	514,363	514,155	514,363	514,155
Adjusted R^2	0.06	0.24	0.03	0.14

Table 10
An Alternative Explanation
This table examines separately the capital regulation stringency in the lead country and in the participant country. The dependent variable in Column (1) is *Syndicate*, and the dependent variable in Column (2) is *%Syndicate*. Capital stringency index is obtained from surveys conducted by Bath, Caprio, and Levine (2013). Definitions of all variables are provided in Appendix A. The regressions are conducted on a bank-pair-year panel, spanning the period from 1995 through 2016. All regressions include year fixed effects, lead-bank fixed effects, and participant-bank fixed effects. Standard errors are clustered by country-pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.:	*Syndicate*	*%Syndicate*
	(1)	(2)
Lead Stringency	-0.003	-0.001*
	(-1.06)	(-1.69)
Participant Stringency	0.006***	0.001***
	(3.17)	(2.80)
Lead GDP per Capita	0.058***	0.006**
	(3.80)	(2.49)
Participant GDP per Capita	0.076***	0.009***
	(4.84)	(5.08)
Lead GDP Growth	0.322***	0.056***
	(4.92)	(4.65)
Participant GDP Growth	0.456***	0.051***
	(9.65)	(5.13)
Ln(Distance)	-0.061***	-0.007***
	(-22.12)	(-16.57)
Common Language	0.020**	0.001
	(2.00)	(1.22)
Year FE	Yes	Yes
Lead, Participant Bank FE	Yes	Yes
Observations	766,439	766,439
Adjusted R^2	0.23	0.17

Table 11

The Choice between Leading and Participating

This table tests a bank's choice between leading a syndicated loan to a foreign firm and participating in a foreign-led syndicate. The sample is a borrower-year-country panel that only includes the borrower-year observations when the borrower obtains at least one syndicated loan in that year. We sample only on banks who are either lead arrangers or syndicate participants to the borrower of interest. The dependent variable is *Participate*, an indicator variable that equals one if banks from a country participate in a given loan while no banks from that country is the lead lender, and zero if one of its banks is the lead arranger. The variable of interest is *Capital Stringency*, the capital stringency faced by the country of interest. All regressions include borrower-year fixed effects. Column (2) additionally controls for country fixed effects and Column (3) further includes country-level controls. *Ln(Distance)* measures the geographical distance between the borrower country and the country of the bank of interest. *Common Language* indicates whether the borrower country shares the same language as the country of the bank. Standard errors are clustered by borrower. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: *Participate*	(1)	(2)	(3)
Capital Stringency	0.001	0.011***	0.012***
	(1.23)	(11.16)	(11.99)
GDP Growth			-0.001*
			(-1.75)
GDP per Capita			1.343***
			(5.58)
Ln(Distance)			0.093***
			(32.03)
Common Language			0.065***
			(9.75)
Borrower × Year FE	Yes	Yes	Yes
Country FE	No	Yes	Yes
Observations	141,707	141,707	141,706
Adjusted R^2	0.56	0.60	0.61

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Table 12
Event Study: IRB Approval
This table examines the changes in syndication activities following banks' receiving the approval to use internal-rating based (IRB) models to estimate risk-weighted assets (Basel II). The sample includes the staggered approval of the IRB by 79 banks from 22 countries between 2007 and 2011. The regressions are conducted on a bank-year-lead country panel, spanning from four years prior to the IRB approval to four years after the approval. The sample excludes the IRB approval years. *IRB* is an indicator variable that equals one for years after a bank was allowed to implement the IRB models. The dependent variable in Column (1) is *Syndicate*, and the dependent variable in Column (2) is *%Syndicate*. All regressions include year fixed effects, participant-bank fixed effects, and lead-country fixed effects. Standard errors are clustered by bank. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.:	*Syndicate*	*%Syndicate*
	(1)	(2)
IRB	-0.065*	-1.759**
	(-1.86)	(-2.61)
Lead Stringency	-0.000	-0.033
	(-0.05)	(-0.52)
IRB × Lead Stringency	0.009**	0.226**
	(2.61)	(2.50)
Δ*GDP per Capita*	-0.084**	-0.643
	(-2.57)	(-0.78)
Δ*GDP Growth*	-0.398*	-8.501*
	(-1.94)	(-1.74)
Ln(Distance)	-0.078***	-2.278***
	(-7.93)	(-6.00)
Common Language	0.018	3.064***
	(1.13)	(3.80)
Year FE	Yes	Yes
Participant Bank FE	Yes	Yes
Lead Country FE	Yes	Yes
Observations	15,333	15,333
Adjusted R^2	0.41	0.51

Table 13
Alternative Measure of Syndication Activity
This table shows results from *Syndicate Share*, the percentage of capital contributed by a participant bank to syndicated loans originated by a lead bank in a given year. Definitions of all variables are provided in Appendix A. Standard errors are clustered by country-pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: *Syndicate Share*	(1)	(2)	(3)
Δ*Capital Stringency*	-0.000	0.010*	0.011**
	(-0.01)	(1.74)	(2.43)
Δ*GDP per Capita*	0.032	0.081	0.099**
	(0.42)	(1.54)	(2.51)
Δ*GDP Growth*	0.500	0.942**	0.908***
	(1.06)	(2.35)	(3.08)
Ln(Distance)	-0.065***	-0.055***	
	(-3.05)	(-4.19)	
Common Language	0.079*	0.038	
	(1.67)	(1.04)	
Year FE	Yes	Yes	Yes
Lead, Participant Country FE	Yes	No	No
Lead, Participant Bank FE	No	Yes	No
Bank-Pair FE	No	No	Yes
Observations	108,103	107,792	90,551
Adjusted R^2	0.09	0.41	0.52

Table 14
Alternative Sampling
This table shows robustness results regarding sampling. Columns (1) and (2) of Panel A report results for a subset of syndicated loans where the lead bank is located in the same country as the borrower. Columns (3) and (4) of Panel A additionally control for whether the lead bank has a subsidiary in the participant's country (*Lead Subsidiary*) and whether the participant bank has a subsidiary in the lead lender's country (*Participant Subsidiary*). All regressions include year fixed effects, lead-bank fixed effects, and participant-bank fixed effects. Panel B reports results from the base analyses while restricting the sample to only non-U.S. banks. Definitions of all variables are provided in Appendix A. Standard errors are clustered by country-pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Lead Lender Location and Foreign Subsidiaries

Dep. Var.:	Lead & Borrower in Same Country		Existence of Foreign Subsidiary	
	Syndicate	*%Syndicate*	*Syndicate*	*%Syndicate*
	(1)	(2)	(3)	(4)
Δ*Capital Stringency*	0.004**	0.043**	0.005***	0.060***
	(2.18)	(2.47)	(2.59)	(3.02)
Δ*GDP per Capita*	0.013	0.011	0.011	0.191
	(1.30)	(0.09)	(0.98)	(1.27)
Δ*GDP Growth*	0.113***	1.240**	0.137***	0.710
	(2.66)	(2.13)	(2.89)	(0.86)
Ln(Distance)	-0.057***	-0.711***	-0.061***	-0.728***
	(-21.34)	(-16.47)	(-22.38)	(-16.70)
Common Language	0.021**	0.179	0.021**	0.155
	(2.26)	(1.58)	(2.05)	(1.33)
Lead Subsidiary			0.007	0.177*
			(0.70)	(1.75)
Participant Subsidiary			0.000	0.256*
			(0.00)	(1.93)
Year FE	Yes	Yes	Yes	Yes
Lead, Participant Bank FE	Yes	Yes	Yes	Yes
Observations	766,439	766,439	766,439	766,439
Adjusted R^2	0.22	0.13	0.23	0.17

Panel B: Non-U.S. Sample

Dep. Var.:	*Syndicate*		*%Syndicate*	
	(1)	(2)	(3)	(4)
Δ*Capital Stringency*	0.004***	0.003***	0.028	0.043**
	(3.04)	(2.63)	(1.46)	(2.47)
Δ*GDP per Capita*	0.016	0.013	0.103	0.150
	(1.28)	(1.09)	(0.61)	(0.97)
Δ*GDP Growth*	0.123***	0.137***	-0.532	0.109
	(2.60)	(2.86)	(-0.71)	(0.16)
Ln(Distance)	-0.026***	-0.062***	-0.503***	-0.714***
	(-9.96)	(-18.78)	(-11.76)	(-15.39)
Common Language	0.028**	0.034**	0.358**	0.255*
	(2.30)	(2.50)	(2.50)	(1.85)
Year FE	Yes	Yes	Yes	Yes
Lead, Participant Country FE	Yes	No	Yes	No
Lead, Participant Bank FE	No	Yes	No	Yes
Observations	552,049	551,886	552,049	551,886
Adjusted R^2	0.07	0.22	0.03	0.14

Table 15
The Effects of Capital Regulations on Global Syndication: Entry Requirement and Funding Insurance

This table examines two other aspects of banking regulation. Columns (1) through (4) examine the effects of *Entry Requirement*, the regulatory requirement for entering into the banking industry. Columns (5) through (8) examine the effect of *Funding Insured*, the percent of deposit insured by the regulatory body. Bank regulatory indices are from the surveys conducted by Bath, Caprio, and Levine (2013). Columns (1), (2), (5), and (6) report results for *Syndicate* and Columns (3), (4), (7), and (8) present results for *%Syndicate*. Definitions of all variables are provided in Appendix A. The regressions are conducted on a bank-pair-year panel, spanning the period from 1995 through 2016. For each combination of dependent variable and regulatory index, we first control for year fixed effects, lead-country fixed effects, and participant-country fixed effects, and then substitute country-level fixed effects with bank-level fixed effects. Standard errors are clustered by country-pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Regulation:	Entry Requirement				Funding Insured			
Dep. Var.:	Syndicate		%Syndicate		Syndicate		%Syndicate	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔRegulation	-0.005**	-0.004*	-0.154***	-0.135***	0.034***	0.034**	0.570***	0.584***
	(-2.22)	(-1.90)	(-4.70)	(-4.52)	(2.59)	(2.18)	(3.18)	(3.33)
ΔGDP per Capita	0.001	0.001	0.039	0.088	-0.029	-0.037*	-0.892***	-0.977***
	(0.10)	(0.10)	(0.25)	(0.59)	(-1.59)	(-1.90)	(-3.49)	(-3.79)
ΔGDP Growth	0.071*	0.078**	-0.783	-0.437	0.175**	0.202**	1.507	1.938
	(1.79)	(1.96)	(-1.32)	(-0.77)	(2.28)	(2.51)	(1.19)	(1.62)
Ln(Distance)	-0.023***	-0.061***	-0.483***	-0.706***	-0.030***	-0.072***	-0.560***	-0.782***
	(-11.27)	(-22.58)	(-11.94)	(-17.73)	(-7.27)	(-14.01)	(-8.55)	(-11.30)
Common Language	-0.000	0.016*	0.071	0.045	0.002	0.030*	-0.035	0.034
	(-0.02)	(1.80)	(0.65)	(0.42)	(0.11)	(1.70)	(-0.19)	(0.17)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead, Participant Country FE	Yes	No	Yes	No	Yes	No	Yes	No
Lead, Participant Bank FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	865,087	864,837	865,087	864,837	203,960	203,827	203,960	203,827
Adjusted R^2	0.06	0.22	0.03	0.14	0.08	0.27	0.03	0.14